

Comprehensive Exam

QUESTIONS

DIRECTIONS: Each of the numbered items or incomplete statements in this section is followed by answers or by completions of the statement. Select the ONE numbered answer or completion that is BEST in each case.

1. A herd of **cattle** is experiencing production losses characterized by chronic diarrhea, poor growth rates, and lower than expected reproductive performance. Secondary **haircoat** changes include generalized hair loss, a brittle texture, and changes to the hair color (lightening). What would be the most likely diagnosis?

- (1) Ergot alkaloid contamination of feed
- (2) Iodism
- (3) Selenium toxicosis
- (4) Molybdenum deficiency
- (5) Copper deficiency

2. A farmer who manages a veal operation has had a series of calves exhibiting anorexia, fever, and drooling. The examination of affected calves reveals fevers, **puffy** cheeks, and a foul **odor** to the breath. The most likely diagnosis is:

- (1) **actinobacillosis.**
- (2) oral necrobacillosis.
- (3) **actinomycosis.**
- (4) vesicular exanthema.
- (5) bovine papular stomatitis.

3. Which one of the following etiologic agents is most likely to cause bacterial **endocarditis** (BE) in a pig less than 1 year of age?

- (1) ***Actinobacillus* species** or *Staphylococcus aureus*
- (2) *Actinomyces pyogenes* or *Streptococcus* species
- (3) *Streptococcus* species or ***Erysipelothrix rhusiopathiae***
- (4) *Staphylococcus aureus* or ***Actinomyces pyogenes***
- (5) *Streptococcus* species or ***Actinobacillus* species**

4. The **polyuria** seen in animals with equine **Cushing's** disease may result from:

- (1) **pyelonephritis.**
- (2) **excessive cortisol secretion.**
- (3) **glomerulonephritis.**
- (4) ~~glomerulonephritis.~~
- (5) polydipsia.

5. A female goat has been losing weight for 6 weeks. This is the only animal affected out of a flock of 75 does, although the owner remembers one or two similar does last year that went on to die. Postmortem examinations were not performed. The clinical examination rules out dental disease, primary **undernutrition**, arthritis, and diarrhea. Two other differential diagnoses high on your list include:

- (1) **Johne's disease** and coccidiosis.
- (2) **Johne's disease** and **visceral caseous lymphadenitis (CLA)**.
- (3) gastrointestinal helminths and **visceral CLA**.
- (4) abomasal emptying defect and **coccidiosis**.
- (5) gastrointestinal helminths and abomasal emptying defect.

6. In a horse that has an acute onset of **blepharospasm**, tearing, and photophobia in one eye, what is the most appropriate approach to **further** evaluation and treatment?

- (1) Apply fluorescein to the eye; if possible for **corneal** ulcer, treat with topical antibiotics and **corticosteroids**.
- (2) Apply a topical anesthetic stain to the conjunctiva, flush the cornea with saline, and then treat the eye with a topical triple antibiotic ointment.
- (3) Apply a topical anesthetic to the conjunctiva followed by fluorescein to the eye; if no ulcer is present, treat with topical antibiotics and antiviral agents.
- (4) Apply fluorescein stain to the eye; if negative, treat with a topical triple antibiotic ointment.
- (5) Apply fluorescein stain to the eye; if positive, treat with antibiotics and a **cycloplegic**.

7. The following laboratory findings are present in an **11-year-old** Thoroughbred gelding with chronic, intermittent abdominal pain: marked increases in **γ -glutamyl transferase (GGT)** and alkaline phosphatase (AP) activity, a mild increase in **sorbitol dehydrogenase (SDH)** activity, a conjugated bilirubin level that is greater than 30% of total bilirubin, marked bilirubinuria, leukocytosis, and **hyperfibrinogenemia** and hyperglobulinemia. What is the most likely diagnosis?

- (1) **Theiler's disease**
- (2) **Tyzzers disease**
- (3) **Mesenteric abscess**
- (4) **Thromboembolic colic**
- (5) Cholelithiasis

8. Which one of the following statements is correct when examining a horse with abdominal pain?

- (1) Sedate the horse immediately and before any clinical examination so that the examination may be carried out in a routine, logical fashion.
- (2) Be aware that some colics responsive to medical therapy may present with severe pain and anxiety.
- (3) Omit a rectal examination if gastric reflux has been demonstrated on gastric intubation.
- (4) Remember that abdominal distention will be present with small intestinal obstruction.
- (5) Be aware that high rectal temperatures are associated with colics in which surgical intervention should be considered.

9. A 4-year-old Holstein cow calved 3 days ago. This morning, she is completely anorexic and her milk production has decreased from 25 kg last evening to 3 kg this morning. She is passing scant amounts of feces. Physical examination findings include a temperature of 39.0°C, a heart rate of 120 bpm, and a respiratory rate of 40 breaths/min. The cow's eyes are sunken and her oral mucous membranes are tacky. Simultaneous auscultation and percussion reveals a large, gas-filled viscus on the right side that extends from the eighth intercostal space to the mid-right paralumbar fossa. The viscus can also be palpated per rectum in the right abdomen. What is the best set of differential diagnoses for this cow's condition?

- (1) Traumatic reticuloperitonitis (TRP), **abomasal displacement**
- (2) Cecal torsion, abomasal **volvulus**
- (3) Cecal displacement, right abomasal displacement
- (4) Gas in the spiral colon, acute diffuse peritonitis
- (5) **Rumen** tympany, abomasal **torsion**

10. Which one of the following statements regarding **microcytosis** is true? **Microcytosis** is:

- (1) most commonly seen **after** acute blood loss.
- (2) a predisposing factor for red maple **toxicosis**.
- (3) most commonly associated with iron deficiency.
- (4) most commonly seen in large animals with intraerythrocyte parasite infestations.
- (5) determined by calculating that mean corpuscular volume (MCV) is abnormally high.

11. Coccidiosis is a disease common to many domestic animals. Which of the following statements is correct?

- (1) Coccidiosis is usually associated with high mortality rates but low morbidity rates.
- (2) *Eimeria* species are the pathogenic organism in all domestic animals.
- (3) Treatment with coccidiostats during episodes of clinical disease is the best course of action.
- (4) Nervous system signs may be seen in individual cattle.
- (5) Diagnosis depends on the demonstration of organisms in the feces.

12. One of your colleagues asks you for a consultation on the serum chemistry profile of a **2-day-old** embryo-transfer calf that has been slightly weak since birth. The calf was born in posterior presentation and had to be delivered by forced extraction. Your colleague tube-fed the calf with 2 L of **colostrum** immediately after delivery, and although the calf was unable to nurse from the cow, it readily suckled colostrum offered by nurse bottle after that time. The calf is normal on physical examination. You notice that the **γ -glutamyl transferase (GGT)** activity of this calf is 996 IU/L. A chart in a clinical pathology text states that the normal GGT activity of cattle is less than 31 IU/L. How would you interpret this laboratory finding?

- (1) The calf has bile **duct atresia**.
- (2) The calf ingested adequate amounts of **colostrum**.
- (3) The calf is septicemic.
- (4) The calf is in renal failure.
- (5) The calf may be suffering from Tyzzers disease.

13. Hyperkalemic periodic paralysis (HYPP) is a heritable disease in:

- (1) horses and humans.
- (2) horses and cattle.
- (3) cattle and pigs.
- (4) humans and pigs.
- (5) sheep and goats.

14. In a "typical" outbreak of pleuropneumonia caused by *Actinobacillus pleuropneumonia*:

- (1) all foals die within 2 weeks of contracting the disease.
- (2) cows are unaffected, but calves develop **enzootic pneumonia**.
- (3) all exposed sheep and goats suffer high mortality rates.
- (4) broodmares suffer signs of upper respiratory disease and those in foal, abort.
- (5) growing pigs are most severely affected, with a high morbidity rate and variable mortality rate.

15. A dairy farmer has cases of swollen, abscessed mandibles in a few of his heifers. The abscesses discharge a thick, yellowish material and do not resolve with antibiotic treatment. The most likely diagnosis is:

- (1) **osteosarcoma**.
- (2) actinomycosis.
- (3) **osteodystrophy**.
- (4) osteoporosis.
- (5) **osteomalacia**.

16. A swine farmer has a group of feeder pigs that are off-feed. Many of these pigs have high fevers and some exhibit reddened, raised lesions with a diamond shape. The most likely diagnosis is:

- (1) erysipelas.
- (2) exudative dermatitis.
- (3) ringworm.
- (4) sporotrichosis.
- (5) sarcoptic mange.

17. A farmer describes an outbreak of **mastitis** that caused a sudden drop in milk production and a painless udder swelling of all four quarters in affected cows. New animals **recently** have been introduced to this large herd, and there is a concurrent problem **with** pneumonia and lameness in the heifers. Milk secretion looks relatively normal, but if a sample is left to stand, a fine grit settles to the bottom of the sample cup. The most likely diagnosis is:

- (1) *Actinomyces pyogenes* mastitis.
- (2) *Mycoplasma* mastitis.
- (3) *Nocardia* mastitis.
- (4) *Streptococcus uberis* mastitis.
- (5) *Staphylococcus epidermidis* mastitis.

18. A 4-year-old mare with acute colitis develops head edema, a painful neck, depression, and anorexia on the fourth day of intravenous fluid and plasma therapy. What is the most likely diagnosis and its treatment?

- (1) Jugular vein thrombosis is the diagnosis and should be treated with catheter removal, topical dimethylsulfoxide (DMSO) or hydrotherapy, and systemic antibiotics.
- (2) Congestive heart failure (CHF) is the diagnosis and should be treated with diuretics and positive inotropic agents, such as digoxin, and reduce sodium in the diet.
- (3) Electrolyte deficiencies causing cardiac arrhythmias is the diagnosis and should be treated with the correction of the underlying electrolyte imbalance, lidocaine for ventricular arrhythmias, or quinidine for atrial fibrillation if arrhythmia persists after electrolyte replacement.
- (4) Acute equine purpura hemorrhagica is the diagnosis and should be treated with hydrotherapy, diuretics, nonsteroidal anti-inflammatory drugs (NSAIDs), and penicillin.
- (5) CHF is the diagnosis, but due to poor prognosis for return to function, euthanasia is recommended.

19. A veterinarian is consulted regarding a 4-year-old horse with a fleshy mass on the eyelid. The owner noticed the mass in February. What should be on the veterinarian's list of differential diagnoses?

- (1) Habronemiasis
- (2) Sarcoid
- (3) Squamous cell carcinoma (SCC) and habronemiasis
- (4) Sarcoid, SCC, and habronemiasis

20. Which one of the following statements regarding acute renal failure in horses is correct?

- (1) Causes of acute renal failure in horses include the administration of nephrotoxic medications [e.g., menadione sodium bisulfite (vitamin K₃)], the consumption of red maple leaves, and the accidental consumption of mercury.
- (2) Adult horses that develop uroliths usually show signs of renal failure because of post renal urinary obstruction.
- (3) Urine sediment analysis in horses with suspected renal tubular disease that shows only a large amount of calcium carbonate crystals in alkaline urine is most suggestive of uroliths because the absence of tubular casts rules out tubular disease.
- (4) A high serum creatinine level combined with low urine specific gravity in a foal 2 days old that has few other clinical signs suggests an underlying congenital renal disorder.
- (5) Because many toxins have a specific site of action, such as glomerular or proximal tubular damage, the best test on horses is a renal biopsy to diagnose the site of damage, leading to the early recognition and removal of the toxin.

21. A veterinarian is consulted regarding transient bouts of loose feces in a 6-year-old riding horse. On examination of the horse, no definitive findings are noted, and the veterinarian recommends routine deworming, vaccinations, and dental care. Four months later, the horse appears to be thin and has a plaque of ventral, midline edema. Upon questioning, the owner reports that the horse's feces also continue to be nonformed. What is the most likely diagnosis?

- (1) Granulomatous enteritis
- (2) Equine monocytic ehrlichiosis (Potomac horse fever)
- (3) Chronic impaction of the small intestine
- (4) Gastric ulceration
- (5) Equine pancreatitis

22. Which one of the following statements regarding anhidrosis in horses is correct? Anhidrosis:

- (1) can be diagnosed with serum sodium measurements.
- (2) is a genetic condition.
- (3) may be complete or partial.
- (4) is seen most commonly in obese mares.
- (5) is treated most commonly with thyroxine and calcium salts.

23. A veterinarian is called to examine a small flock of sheep with swelling and stiffness of the limbs, ventral abdominal distention, and depression. Two young sheep have died. A postmortem examination reveals dilated right and left ventricles of the heart, acute congestion of the liver, and significant pleural, pericardial, and peritoneal fluid. The sheep were fed a 3-kg mixture of 50:50 oat hay and alfalfa hay, 1-kg of a 16% grain mix labeled for sheep, and they had free access to a 22% protein/trace mineral supplement labeled for beef cattle. Vaccination and deworming prophylaxis appeared adequate. What is the most likely diagnosis and how should this diagnosis be confirmed?

- (1) Chronic parasitism confirmed by intestinal parasites found in fecal floatations
- (2) Congestive heart failure (CHF) due to toxic exposure (most likely gossypol toxicosis) confirmed by free gossypol found in the protein and mineral supplement and concentrate mix
- (3) Acute hepatotoxicity due to plant toxicity confirmed by pathognomonic lesions or rumenotomy found in a liver biopsy
- (4) Ovine progressive pneumonia serology or viral isolation from blood
- (5) Liver flukes confirmed by a Baermann float of feces

24. Blindness can be associated with a variety of conditions in domestic animals. Which conditions often result in blindness?

- (1) Leptospirosis in horses, vitamin D toxicosis in cattle
- (2) Polioencephalomalacia in calves, lead poisoning in cattle
- (3) Lead poisoning in cattle, listeriosis in sheep
- (4) Leptospirosis in horses, listeriosis in sheep
- (5) Vitamin D toxicosis in cattle, polioencephalomalacia in calves

25. Which one of the following pairs describing the etiologic agent and treatment of liver abscesses in cattle is correct?

- (1) *Escherichia coli* —gentamicin
- (2) *Salmonella typhimurium* —trimethoprim-sulfamethoxazole
- (3) *Actinomyces bovis* —tilmicosin
- (4) *Fusobacterium necrophorum* —penicillin
- (5) *Aspergillus* —thiabendazole

26. Which one of the following is most likely to cause intravascular hemolysis in cattle?

- (1) *Anaplasma marginale*
- (2) *Cryptosporidium parvum*
- (3) *Cryptosporidium parvum*
- (4) Onion toxicosis
- (5) *Babesia bigemina*

27. A client has a 9-day-old Standardbred filly foal that has had diarrhea of 1 day's duration. The veterinarian examines the foal and finds no abnormalities other than watery feces. What is the appropriate next measure?

- (1) The owner should apply petroleum jelly to the perineum and call the veterinarian if the diarrhea persists for more than another 48 hours.
- (2) The owner should consider having a galactose tolerance test run on the foal.
- (3) Flunixin meglumine and lincomycin should be administered to the foal.
- (4) The owner should observe the foal for 2 more days. The mare and foal should be separated, except for two daily feedings.
- (5) An enema should be administered to treat meconium impaction.

28. An 8-year-old horse has a persistent cough when stabled but is otherwise afebrile and maintains a good appetite and demeanor. Which one of the following statements apply to this case?

- (1) The cough is usually an immunologic reaction to airborne allergens, and cellular infiltration of the lower airways is a neutrophilic type because of secondary bacterial colonization.
- (2) Finding eosinophils in the lower airways is highly consistent with a diagnosis of allergic lower airway disease, such as chronic obstructive pulmonary disease (COPD) or heaves
- (3) Using the atropine challenge test for a diagnostic test, failure to relieve the signs suggests that clinical signs are caused by a disease other than COPD.
- (4) After changing management practices to reduce the dust in the environment and using corticosteroids to reduce airway irritation, both treatments can be eliminated gradually as clinical signs abate.
- (5) Other signs might include exercise intolerance and abdominal muscle hypertrophy, with changes in intrapleural pressure larger than 10 mm Hg.

44. A dairy client has an unacceptable prevalence of *Staphylococcus aureus* mastitis. Which one of the following statements is the best advice?

- (1) Treat all cases of clinical mastitis with intramammary penicillin during lactation.
- (2) Cull animals with *S. aureus* or segregate and milk separately.
- (3) Immediately cease milking all culture-positive cows and dry teat.
- (4) Treat all culture-positive cows with intramuscular penicillin.
- (5) Strip out affected quarters from culture-positive cows every 2 hours.

45. In a pig barn with problems of low-grade cough, prolonged time to reach market weight, and some carcasses showing cranio-ventral lung consolidation and peribronchial lymphoid cuffing, what is the most likely diagnosis?

- (1) Porcine reproductive and respiratory syndrome (PRRS)
- (2) Enzootic pneumonia caused by inadequate ventilation
- (3) Chronic form of *Actinobacillus (Hemophilus)* pleuropneumonia
- (4) Swine influenza followed by secondary *Pasteurella multocida* pneumonia
- (5) *Mycoplasma hypopneumoniae* infection in the herd

46. Hypomagnesemic tetany of ruminants also may be known as:

- (1) milk fever, grass staggers, or alkali disease.
- (2) grass tetany, milk fever, or alkali disease.
- (3) "downer cow" syndrome, wheat pasture poisoning, or grass tetany.
- (4) lactation tetany, grass staggers, or wheat pasture poisoning.
- (5) "downer cow" syndrome, lactation tetany, or eclampsia.

47. In ruminants with obstructive urolithiasis, which one of the following clinical scenarios is most likely?

- (1) In cases of complete urethral obstruction with bladder rupture, there is inappetence, depression and colic signs with kicking at the abdomen.
- (2) Straining to urinate may be sufficient to prolapse the rectum, and obstructed sheep may also show tail wriggling.
- (3) For early cases in which urethral or bladder rupture have yet to occur, it is possible to attempt medical therapy by passing a catheter retrograde into the bladder.
- (4) If the bladder is ruptured, surgical closure of the defect is usually required for the steer to resume urine flow.
- (5) In sheep and goats, the obstruction at the vermiform appendage is often a solitary calculus that can be crushed to allow the free flow of urine.

48. A veterinarian is called to examine a 19-year-old, grey, Hunter-type gelding because the owner had noticed that the horse had been losing weight over the past 2 months. Clinical examination reveals the horse to be severely underweight, but there are no other abnormal findings. Weight loss without other abnormal findings could be caused by:

- (1) chronic obstructive pulmonary disease (COPD), liver flukes, or lymphosarcoma.
- (2) lymphosarcoma, squamous cell carcinoma of the stomach, or COPD.
- (3) liver flukes, malnutrition, or intestinal clostridiosis.
- (4) squamous cell carcinoma of the stomach, malnutrition, or granulomatous enteritis.
- (5) intestinal clostridiosis, lymphosarcoma, or squamous cell carcinoma of the stomach.

49. A 4-day-old calf has stopped nursing during the previous 12 hours, is depressed, lacks a menace reflex, has a rectal temperature of 39.9°C, and is showing signs of a stiff neck. The calf had a normal birth and suckled well on the first day. Which one of the following statements is correct?

- (1) If this were a foal, the signs are typical for neonatal maladjustment syndrome (NMS).
- (2) Intrauterine bovine virus diarrhea (BVD) infection at mid-gestation could explain these signs.
- (3) An important part of the diagnostic regimen is a cerebrospinal fluid (CSF) sample and test for passive transfer.
- (4) The depression and lack of menace reflex suggest hydrocephalus or hydranencephaly; therefore, there is no treatment for this calf.

50. The proper treatments for sole ulcer include:

- (1) corrective trimming, pressure bandaging, and claw elevation (block).
- (2) systemic antibiotics, corrective trimming, and footbaths.
- (3) claw elevation (block), systemic antibiotics, and footbaths.
- (4) corticosteroids, pressure bandaging, and corrective trimming.
- (5) tetracycline sprays, systemic antibiotics, and pressure bandaging.

51. Which one of the following statements regarding bovine leukosis is true?

- (1) It is spread primarily via aerosol infection.
- (2) It may produce signs of spinal cord disease.
- (3) It is preventable through vaccination.
- (4) It manifests as lymphosarcoma in most patients.
- (5) It has been proven to be a zoonosis.

52. Which one of the following conditions would likely cause abdominal pain in foals?

- (1) Meconium impaction, gastric ulceration, cryptosporidiosis
- (2) Gastric ulceration, granulomatous enteritis, ascarid impaction
- (3) Meconium impaction, intussusception, ascarid impaction
- (4) Intussusception, cryptosporidiosis, abdominal hernias
- (5) Abdominal hernias, granulomatous enteritis, small intestinal volvulus

53. In the late summer, a 6-month-old Holstein heifer has had signs of depression and recumbency over the last 24 hours. Two other calves (of a group of 10) have died in the past week. The owner thinks the animals may have convulsed before they died. The other calves had loose, bloody stools and were being treated for presumed coccidiosis with amprolium, as well as with oral trimethoprim-sulfa and a multivitamin complex.

On physical examination of this 6-month-old calf, all vital signs are mildly elevated. The animal is depressed, is in left lateral recumbency, and has its head back (i.e., opisthotonos). Reflexes are intact, but the calf will not support itself in sternal recumbency. Menace reflex is absent bilaterally, but pupillary light reflexes are intact, and there is a dorsomedial strabismus. The state of hydration and mucous membranes are normal, feces appear to be formed, and there is normal rumen motility. What is the most likely diagnosis?

- (1) Lead toxicity
- (2) Polioencephalomalacia
- (3) Nervous coccidiosis
- (4) Thromboembolic meningoencephalitis (TEME)
- (5) Vitamin A deficiency

54. Of the following treatments, the best therapy for acute coliform mastitis is:

- (1) intramammary treatment with gentamicin.
- (2) oral fluids.
- (3) stripping the affected quarters frequently.
- (4) intravenous calcium.
- (5) 500 mg of dexamethasone twice daily for 7 days.

55. A veterinarian auscultates a 2-month-old calf that is small for its age. On auscultation, the veterinarian hears a grade III pansystolic murmur on both sides of the chest. When a cardiac catheterization is performed, elevated cardiac pressures, particularly in the right ventricle, are found. The most likely heart defect is:

- (1) patent ductus arteriosus (PDA).
- (2) ventricular septal defect (VSD).
- (3) vegetative endocarditis involving the right atrioventricular (AV) valve.
- (4) right AV valvular insufficiency.
- (5) aortic insufficiency.

56. A veterinarian is called to examine an 8-year-old Thoroughbred mare with a 12-hour history of anorexia, depression, and the voidance of reddish brown urine. Physical examination reveals a rectal temperature of 39.8° C, a heart rate of 80 beats/min, and a respiratory rate of 30 breaths/min. The horse's mucous membranes are pale and her sclerae are icteric. Laboratory findings include a packed cell volume (PCV) of 16.2% and red-tinged plasma. The discoloration of the plasma remains after centrifugation. The urine is positive for occult blood and protein. Based on the clinical and laboratory findings, what is the most likely set of differential diagnoses?

- (1) Acute glomerulonephritis, equine infectious anemia (EIA), anaplasmosis, red maple leaf toxicosis
- (2) Babesiosis, EIA, red maple leaf toxicosis, autoimmune hemolytic anemia
- (3) Babesiosis, equine exertional rhabdomyolysis, phenothiazine toxicosis, anaplasmosis
- (4) Equine exertional rhabdomyolysis, pyelonephritis, EIA, phenothiazine toxicosis
- (5) Babesiosis, autoimmune hemolytic anemia, pyelonephritis, equine exertional rhabdomyolysis

57. A 4-year-old Standardbred horse with a history of hind limb ataxia for 1 month exhibits muscle atrophy to the left gluteal region. The same sign is exhibited in 15 other horses, including brood mares and foals, none of which have had any recent signs of illness. Which one of the following statements is correct?

- (1) A cerebrospinal fluid (CSF) sample should be obtained and assessed for evidence of sarcocystic neuron exposure.
- (2) Cervical radiographs with myelography are the most likely method of diagnosis.
- (3) Green pasture and fodder with supplemental vitamin E might have prevented this problem.
- (4) A CSF sample of high protein with the lack of inflammatory cells will likely be found given this history.
- (5) Finding eosinophils in the CSF is highly suggestive of equine protozoal myeloencephalitis (EPM).

58. Examination of the right rear foot of a mature dairy cow reveals warmth and swelling of the coronet. Also, there is a moist, red fissure in between the claws and a foul odor to the foot. The most likely diagnosis is:

- (1) infectious pododermatitis.
- (2) stable foot rot.
- (3) laminitis.
- (4) greasy heel.
- (5) underrun sole.

59. Crushing deaths of piglets often may be related to:

- (1) lactation tetany of sows.
- (2) liver disease of piglets.
- (3) vitamin E and selenium deficiency of piglets.
- (4) hypothermia and hypoglycemia of piglets.
- (5) iron deficiency of piglets.

60. Which one of the following statements regarding cryptosporidiosis is true?

- (1) It is a skin disease of horses.
- (2) It is a secretory diarrhea of calves.
- (3) It is a pyogranulomatous lung infection of pigs.
- (4) It is a foot (hoof) disease of sheep.
- (5) It is an arthritis of goats.

61. Neonatal isoerythrolysis is diagnosed in a mule foal with acute hemolytic anemia. Which one of the following transfusion treatments would be the most appropriate?

- (1) Whole blood from a male horse related to the dam
- (2) Whole blood from the (horse) dam
- (3) Washed erythrocytes from the (donkey) sire
- (4) Plasma from a horse lacking the Aa or Qa blood group antigens
- (5) Washed erythrocytes from an unrelated male donkey

62. A 15-year-old Arabian mare is brought to a veterinarian because of recurrent episodes of colic. Differential diagnoses would include which of the following?

- (1) Enterolith, pedunculated lipoma, salmonellosis
- (2) Enterolith, *Dictyocaulus imfieldi* infestation, thromboembolic infarction
- (3) Pedunculated lipoma, parasitic larval migration, intestinal foreign body
- (4) Thromboembolic infarction, salmonellosis, sand impaction
- (5) Sand impaction, *D. imfieldi* infestation, feed impaction

63. Which set of signs is most consistent with lead toxicity in large animals?

- (1) The chronic form is reported in horses and can manifest as paralysis of the recurrent laryngeal nerve and the pharynx, resulting in recurrent choke, regurgitation of food, and aspiration pneumonia.
- (2) The acute form often shows a sudden onset and short duration of disease occurring within 12–24 hours.
- (3) In the subacute form, in addition to neurologic signs of depression and blindness with nonreactive pupils, there are also signs of gastroenteritis (e.g., ruminal atony accompanied by constipation in the early stages), followed by fetid diarrhea (caused by abomasitis from lead salts).
- (4) A key clinical sign to differentiate from polioencephalomalacia (PEM; a major differential diagnosis) is rumen motility, which is only mildly reduced in lead toxicity. The rumen is often fluid filled and atonic in PEM due to the diet change.

DIRECTIONS: Each of the numbered items or incomplete statements in this section is negatively phrased, as indicated by a capitalized word such as NOT, LEAST, or EXCEPT. Select the ONE numbered answer or completion that is BEST in each case.

65. An effective intestinal parasite control program for sheep in North America would NOT include:

- (1) prelambling deworming of adults with ivermectin.
- (2) deworming of lambs in the spring before turning them out on pasture.
- (3) raising lambs indoors and feeding hay from elevated racks.
- (4) use of pastures grazed by cattle for rotation into sheep grazing.
- (5) deworming of feeder lambs every 3 weeks during the winter with thiabendazole.

66. Which one of the following does NOT typically cause regenerative anemia?

- (1) Postparturient hemoglobinuria
- (2) Acute blood loss
- (3) Iron deficiency
- (4) Onion toxicosis
- (5) *Anaplasma marginale* infection

64. A veterinarian examines a 22-hour-old Thoroughbred filly that was born on a farm with above-average to excellent management conditions. The foal is vigorous and in excellent health as far as the veterinarian can ascertain. Because the mare reportedly leaked some colostrum immediately prior to foaling, the veterinarian decides to evaluate the foal's immunoglobulin concentration using an enzyme-linked immunosorbent assay (ELISA) test. The immunoglobulin G (IgG) concentration is greater than 400 mg/dl, but less than 800 mg/dl. Based on this result, the veterinarian should:

- (1) supplement the foal with additional mare colostrum.
- (2) supplement the foal with bovine colostrum.
- (3) administer 2 L of commercial plasma intravenously.
- (4) treat the foal with broad-spectrum antibiotic.
- (5) not do anything.

67. Clinical findings with dental disease in horses include all of the following EXCEPT:

- (1) quidding.
- (2) eating hay in preference to grain.
- (3) slow, painful mastication.
- (4) weight loss.
- (5) choke.

68. A dairy cow in the second week of lactation is noted to have pale mucous membranes, tachycardia, weakness, and hemoglobinuria. Which one of the following would NOT be a logical course of action?

- (1) Increase efforts to control arthropods.
- (2) Examine the phosphorous content of the ration.
- (3) Examine urine by dark-field microscopy.
- (4) Check the animal's diet for oxidant-containing plank.
- (5) Examine erythrocytes for rickettsial organisms.

69. All of the following patients should undergo surgical repair for patent urachus EXCEPT:

- (1) A hospitalized foal **younger** than 5 days old with a normal rectal temperature, normal results on a complete blood count (CBC), and a normal fibrinogen concentration.
- (2) A foal with urine continuing to dribble from the urachus 1 week following cauterization with silver nitrate.
- (3) A foal in which ultrasound examination of the umbilicus reveals urachal abscess.
- (4) A foal with an umbilicus that is hot and painful on palpation and exuding a purulent discharge.
- (5) A foal that has evidence of subcutaneous fluid accumulation in the area of the external umbilical remnants.

70. A Holstein calf is suspected of having bovine leukocyte adhesion deficiency (BUD). Which one of the following findings is NOT characteristic of BLAD?

- (1) Persistent neutropenia
- (2) Lymphadenopathy
- (3) Gingivitis
- (4) Fever
- (5) Bronchopneumonia

71. Several **weanling** beef calves die from excessive hemorrhage after dehorning. The farmer has additional calves to dehorn. Which one of the following recommendations would NOT be correct?

- (1) Determine that the prothrombin time is normal before dehorning more calves.
- (2) Only feed sweet clover as silage.
- (3) Analyze feed for **dicoumarol** or related compounds.
- (4) Treat calves with vitamin K₁.
- (5) Discard all moldy sweet clover hay.

ANSWERS AND EXPLANATIONS

1. The answer is 5 [Chapter 16 III D 2]. This clinical picture best fits primary copper deficiency or molybdenum excess. Ergot (*Claviceps purpurea*) contamination of feed results in gangrene of the extremities. Chronic selenium toxicosis results in laminitis and hair loss, which is usually most prominent on the tail. Iodine toxicity clinically presents as increased lacrimation, epiphora, nasal discharge, seborrhea, and hair loss.

2. The answer is 2 [Chapter 1 II 1]. The set of clinical findings best describes oral **necrobacillosis** (necrotic stomatitis). **Actinobacillosis** involves the tongue, whereas actinomycosis is an osteomyelitis usually of the mandible. Vesicular exanthema is a disease of swine. Bovine papular stomatitis produces only mild clinical signs with oral papules or coalescent lesions on the muzzle and oral mucous membranes.

3. The answer is 3 [Chapter 8 II B 6 c]. Bacterial endocarditis (BE) in swine is frequently caused by either *Streptococcus* species or *Erysipelothrix rhusiopathiae*. **Actinobacillus equuli** is one of the two common organisms associated with the disease in horses. **Actinomyces pyogenes** is frequently isolated from affected cattle.

4. The answer is 2 [Chapter 10 III A 3 b (1)]. In equine Cushing's disease, **polyuria** may result from excessive cortisol secretion. Excessive cortisol secretion results from chronic adrenocorticotrophic hormone (ACTH) release by the pituitary gland. High cortisol levels may block antidiuretic hormone (ADH) or its effect on the kidney. Also, the **hyperglycemia** resulting from excessive corticosteroid levels may cause an osmotic diuresis.

5. The answer is 2 [Chapter 4 II B 1, 2]. Both **Johne's** disease and visceral caseous lymphadenitis (CLA) cause chronic weight loss in adult goats. Coccidiosis causes diarrhea in young ruminants, whereas gastrointestinal helminths usually produce a herd level problem with poor growth rates and poor performance. Abomasal emptying defect is a specific condition reported only in Suffolk sheep.

6. The answer is 5 [Chapter 12 I A 3–4]. In a horse with the acute onset of blepharospasm, tearing, and photophobia in one eye, fluorescein dye should be applied to the cornea to detect any ulcers. If ulcers are present, correct therapy entails the administration of antibiotics and **cytoplegics**. Antiviral agents have not been employed with any reliability and in this case, the lesion is only in one eye, decreasing the likelihood of a systemic viral event, which more commonly results in bilateral lesions. Broad-spectrum antibiotics are not necessary if there is no ulcer or severe conjunctivitis present. If overused, broad-spectrum antibiotics may lead to mycotic superinfection.

7. The answer is 5 [Chapter 5 II A 3 a (2), d (2)]. Recurrent abdominal pain, obstructive icterus (as evidenced by the increased serum levels of cholestatic enzymes, conjugated bilirubinemia, and bilirubinuria), and an inflammatory leukogram are most consistent with a diagnosis of cholelithiasis. Theiler's disease does not present as recurrent abdominal pain, or with laboratory evidence of obstructive icterus. Tyzzer's disease is a disease of young foals, not adult horses. Horses with either **thromboembolic colic** or a mesenteric abscess will present with recurrent abdominal pain and an inflammatory leukogram, but not with signs of obstructive **icterus**.

8. The answer is 2 [Chapter 2 I A 2]. Some colics that respond to medical management, such as those due to gastric dilatation, present with severe pain and anxiety. Clinical examinations should be performed as much as possible without sedation of the animal so as not to mask clinical findings. Rectal examinations should always be performed as part of the complete physical examination when presented with a horse exhibiting abdominal pain. Abdominal distention is not present in cases of small intestinal obstruction because any distention is restricted by the thoracic cage. High rectal temperatures are most often associated with non-surgical conditions, such as bacterial infections.

9. The answer is 2 [Chapter 3 I C 2]. Cecal torsion or **abomasal** volvulus are the most likely causes of this cow's distress. The gas-filled viscus on the right side of a mature cow

must be either the cecum or the abomasum. This cow is clearly in shock, suggesting that circulation to the viscus must be compromised. Therefore, the viscus is most certainly twisted (as a result of torsion or volvulus), rather than simply displaced or distended. A diffuse peritonitis may produce auscultable abdominal gas, but the ability to detect the displaced viscus via rectal palpation defines the involvement of the abomasum or cecum.

10. The answer is 3 [Chapter 14 I A 2 c (1)]. Compared with human beings and small animal species, all large animals, particularly small ruminants, have relative microcytosis. True microcytosis is most commonly seen with iron deficiency, when erythrocytes contain less hemoglobin than normal.

11. The answer is 4 [Chapter 11 II D 2]. Individual cattle may exhibit nervous signs (convulsions) with coccidiosis. Coccidiosis is most commonly a disease associated with high morbidity rates (i.e., many animals are affected) but low mortality rates (i.e., few animals die). Although *Eimeria* species are commonly pathogenic to ruminants, *Isospora* species cause disease in pigs. Treatment of individuals is less rewarding than prevention, which is carried out through a combination of coccidiostats and improvements in hygiene. Animals may exhibit disease (diarrhea) prior to the passage of oocysts in the feces, but healthy animals can also shed fecal oocysts.

12. The answer is 2 [Chapter 18 IV C 3 j]. γ -Glutamyl transferase (GGT) activity greater than 300 IU/L usually indicates that a calf has consumed adequate amounts of colostrum. Colostral CCT concentration in the bovine is approximately 300 times the serum CCT concentration. Diagnoses of septicemia or liver involvement are unlikely in a calf that appears systemically healthy. Renal failure should not cause an increase in GGT activity in serum.

13. The answer is 1 [Chapter 9 II B]. Hyperkalemic periodic paralysis (HYPP) is described as a heritable muscle disease of horses (Quarter horses, Appaloosas, American point hoes, and Quarter horse crosses) and humans. In humans, it is referred to as HYPP or adynamia episodica hereditaria. Defective sodium channels in the nervous system remain open after membrane depolarization, allowing excessive inward sodium movement and heightened membrane depolarization. Simultaneously, normal sodium channels may be in-

activated, preventing the development of normal action potentials and leading to muscular weakness. Affected horses exhibit muscle fasciculations and spasms of the face, jaws, and legs, followed by weakness and recumbency.

14. The answer is 5 [Chapter 7 I B 4 b]. *Actinobacillus pleuropneumoniae* causes porcine pleuropneumonia. When introduced into naive herds, the bacteria cause signs of pneumonia (fever, coughing, abnormal respiratory patterns). Morbidity and mortality rates are usually highest in the feeder pig population.

15. The answer is 2 [Chapter 13 II B 2, 5]. This set of clinical findings (i.e., swollen abscesses on the mandibles that discharge a thick, yellowish material and do not resolve with antibiotic treatment) best describes actinomycosis (lumpy jaw). Cancerous, degenerative, or nutritional deficiencies do not match the clinical findings or subjective information presented.

16. The answer is 1 [Chapter 16 V F 2]. Diamond-shaped skin lesions occurring in pigs that are anorexic and febrile are most likely caused by Erysipelas. Exudative dermatitis or greasy pig disease is a seborrheic skin condition. Ringworm is not accompanied by systemic signs. Sporotrichosis is a nodular disease of horses. Sarcocystis mangle affects pigs, but the primary clinical finding is pruritus.

17. The answer is 2 [Chapter 17 I C 6 b]. The set of clinical findings (i.e., sudden drop in milk production, painless udder swelling of all four quarters in affected cows, concurrent problems with pneumonia and lameness, fine grit in the bottom of the sample cup) best fits the pattern of disease experienced with an outbreak of *Mycoplasma mastitis*.

18. The answer is 1 [Chapter 8 II C 2, 5]. The horse is suffering from jugular vein thrombophlebitis. The horse has several of the predisposing factors for the development of this condition, including protracted duration of catheter indwelling (more than 3 days), possible endotoxemia or septicemia from colitis leading to a coagulopathy, and administration of plasma and other fluid products through the catheter. Physical examination findings (i.e., a painful neck, head edema, depression, reluctance to put its head down to eat) support the diagnosis. Treatment includes the removal of the catheter, topical hydrotherapy or hot packs, topical anti-inflammatory agents

such as dimethyl sulfoxide (DMSO), and appropriate antibiotics. Congestive heart failure (CHF) should not cause a painful neck and is not a likely consequence of acute colitis. Purpura hemorrhagica causes a vasculitis, usually resulting in leg and ventral abdominal edema, in addition to bottle jaw. A history of respiratory disease is usually present. Cardiac arrhythmias due to electrolyte imbalances do not result in a painful neck. Signs of CHF (such as head edema) are a late sequelae to cardiac arrhythmias, and other clinical signs should be apparent at that time (e.g., jugular vein distention, jugular pulses, ascites).

19. The answer is 4 [Chapter 12 III A 4]. Sarcomas, squamous cell carcinomas (SCCs), and habronemiasis have similar clinical presentations and often cannot be diagnosed definitively without the aid of histopathology. A biopsy with histopathologic examination is suggested to rule out other types of tumors and habronemiasis.

20. The answer is 1 [Chapter 15 I A 1 c]. Causes of acute renal failure in horses include the administration of nephrotoxic medications, the consumption of red maple leaves, and the accidental consumption of mercury. Obstruction does not commonly occur in horses. Calcium carbonate crystals are normally found in horse urine, and the alkaline urine readily dissolves casts. Some normal foals can have serum creatinine elevations temporarily after birth, and foals also have dilute urine at this time. Biopsy is not of value and poses a risk to the patient.

21. The answer is 1 [Chapter 2 III A]. The 6-year-old riding horse most likely has granulomatous enteritis (lymphocytic-plasmacytic enteritis), an immune-mediated disorder that causes a malabsorption syndrome. Characteristic findings include a chronic, nonresponsive diarrhea and possibly ventral edema. Equine monocytic ehrlichiosis (Potomac horse fever) is characterized by acute, watery diarrhea that lasts approximately 10 days in most horses. Gastric ulceration is associated with recurrent abdominal pain more often than diarrhea, and there is usually a history of nonsteroidal anti-inflammatory drug (NSAID) use. Chronic impaction of the small intestine would more likely be associated with colic than diarrhea.

22. The answer is 3 [Chapter 10 VII C 2]. Horses with anhidrosis may be completely un-

able to sweat or exhibit only partial sweating. Serum sodium levels are not affected, and the condition is not known to be genetic. There is no age, breed, or sex predilection. Anhidrosis is diagnosed by clinical findings, and treatment is symptomatic.

23. The answer is 2 [Chapter 8 V B 1]. Sheep and goats (particularly young animals) are more susceptible to the signs of gossypol toxicosis than cattle. Adult ruminants are able to detoxify gossypol by forming stable complexes with soluble proteins in the rumen. The 22% protein/trace mineral supplement labeled for beef cattle, which was being fed, revealed high amounts of free gossypol/kg in the supplement, and there were also high amounts of gossypol in the concentrate mix. Gossypol toxicosis results in cardiomyopathy by inactivating enzymes that are important in allowing myocardial cells to respond to oxidative stress. The sheep were adequately dewormed, so chronic parasitism or liver flukes were unlikely. Acute hepatotoxicity usually results in gastrointestinal or neurologic signs before causing congestive heart failure (CHF). Ovine progressive pneumonia virus infection usually results in pneumonia in older goats or may be a cause of ill thrift or mastitis.

24. The answer is 2 [Chapter 11 II C 1 b (1), 2 b (1) (b)]. Blindness is a finding in calves with polioencephalomalacia and in cattle with lead poisoning. Recurrent uveitis (blindness) in horses often develops as a sequela to systemic leptospirosis; however, neither listeriosis in sheep nor vitamin D toxicosis in cattle have blindness associated with the clinical picture.

25. The answer is 4 [Chapter 5 III A 1 c, e]. The organism most often responsible for causing liver abscesses is *Fusobacterium necrophorum*. Long-term penicillin or tetracycline therapy is indicated for the treatment of individual affected animals.

26. The answer is 5 [Chapter 14 I D 2 a (2) (c), (d)]. The intraerythrocytic protozoan of genus *Babesia* commonly cause intravascular hemolysis, whereas rickettsial organisms and oxidative agents frequently cause extravascular hemolysis. Cobalt deficiency is associated with depression anemia but not hemolysis.

27. The answer is 1 [Chapter 2 II B 11]. The most likely diagnosis in this case is foal beat

diarrhea. These patients require symptomatic and supportive care only (e.g., application of petroleum jelly to the perineum). Other tests and treatments are only warranted if clinical signs deteriorate or if the condition persists. Observing the foal closely is valuable advice but separating the foal and the mare and providing for only two daily feedings would surely limit calorie intake for the foal. Mecconium impaction is seen in younger foals presenting with straining, inappetence, abdominal distention, and an inability to pass feces.

28. The answer is 5 [Chapter 7 I F 2 b]. The clinical description best fits chronic obstructive pulmonary disease (COPD). The cough reflects a pulmonary hyperreactivity to airborne antigens, and the lower airway cytology will be neutrophilic because of immune, rather than bacterial, stimulation. Failure of the atropine challenge test reflects a chronic, irreversible bronchospasm, which indicates limited value of bronchodilator therapy. Management practice to reduce environment dust and pollution must be continuous and permanent. Likewise, low-dose corticosteroids may be instituted as long-term therapy in the chronically affected horse. Finally, nondegenerative neutrophils in the bronchoalveolar exudate is suggestive of COPD.

29. The answer is 5 [Chapter 8 II B 6 e]. The clinical findings best support a diagnosis of right-sided heart failure and tricuspid regurgitation. Right-sided heart failure and tricuspid regurgitation may be caused by bacterial endocarditis, septic pericarditis, and myocardial lymphosarcoma, as well as by cor pulmonale. Aortic valve insufficiency produces a left-sided heart murmur with subsequent signs of congestive heart failure (CHF). Pyrrolizidine alkaloid toxicosis produces hepatic dysfunction with resultant liver, central nervous system (CNS), gastrointestinal, or skin disease. Acute grain overload causes bloat, depression, dehydration, acidemia, diarrhea, and death.

30. The answer is 2 [Chapter 4 II A 3]. Pulpy kidney disease (enterotoxemia, overeating disease) is caused by *Clostridium perfringens* type D. The most common manifestation is sudden death in growing sheep on high-energy (fattening) diets. Salmonellosis usually presents as fever, depression, and hemorrhagic diarrhea. Shipping fever is a disease of beef cattle characterized by pneumonia. Abomasal emptying defect, a condition of Suffolk sheep, causes signs of anorexia and

chronic wasting. Coccidiosis causes a severe, watery diarrhea in lambs.

31. The answer is 5 [Chapter 18 III C 2 c (3) (c); IV A 2 b (1), B 1 a (2); Table 18-31]. The risk factors present in this foal are poor colostrum quality, fetal distress/anoxia in utero, delayed colostrum intake, and dysmaturity. The mare leaked colostrum prior to delivery, therefore, colostrum quality is probably poor. Mecconium staining indicates that fetal distress/anoxia was present during the birth process. Colostrum intake was delayed; foals should start suckling no later than 3 hours after birth. Although the foal was not born prematurely by most definitions, it has many characteristics indicating dysmaturity, including a silky haircoat, lax flexor tendons, and a domed forehead.

32. The answer is 1 [Chapter 3 II B 2 e (3) (c); Chapter 4 II B 1]. Both clinically and subclinically affected animals will shed *Mycobacterium* paratuberculosis, which may then be ingested by susceptible animals. *M. paratuberculosis* infection, also known as Johne's disease or paratuberculosis, can affect cattle and small ruminants, but is not known to infect pigs. Infection initially causes histologic lesions in the small intestines and associated mesenteric lymph nodes and later affects the large intestine. *M. paratuberculosis* is not invariably fatal. There is evidence that the organism may be acquired and eliminated by many animals. Although diarrhea occurs in diseased cattle, in small ruminants (i.e., sheep and goats) it is more common to find emaciation without diarrhea.

33. The answer is 2 [Chapter 13 I A 2 a (2) (a)]. White muscle disease is the most likely condition given the set of clinical findings. Paralytic myoglobinuria occurs in older, heavily muscled animals. Tying-up syndrome is a condition of horses, and blackleg of cattle results most commonly in sudden death of older animals. With osteomyelitis, there should be evidence of a swollen, painful lesion usually over a joint.

34. The answer is 5 [Chapter 6 I B]. The Jersey cow has clinical signs that are typical for allergic rhinitis (i.e., characteristic color to the nasal discharge, bilateral nature of the discharge, nasal pruritus). The discharge from ethmoid carcinoma is more often unilateral and signs of blocked nasal passages are promi-

nent, with no sneezing or nasal pruritus. Nasal botflies are not known to affect cattle. Malignant bovine catarrh (MBC) is a systemic disease with far more severe signs, such as erosion of the nares, fever, and lymphadenopathy. Infectious bovine rhinotracheitis (IBR) does not present with signs specific to nasal irritation.

35. The answer is 2 [Chapter 9 I I 2 b]. Dairy calves on whole-milk diets are able to absorb less magnesium as they age. This set of clinical findings best fits a diagnosis of hypomagnesemic tetany. With polioencephalomalacia and lead poisoning, calves are blind or apparently blind. Tetanus presents with more tetanic signs, and nervous ketosis is a disease of early lactation mature cows.

36. The answer is 3 [Chapter 10 VI A 3]. In horses, primary hyperparathyroidism is the result of parathyroid hyperplasia or neoplasia.

37. The answer is 1 [Chapter 14 III A 1 b (1)]. Multicentric lymphoma in adult cattle (older than 3 years) is almost always associated with infection with the bovine leukosis virus (BLV). None of the other forms of lymphoma in horses or cattle is thought to have a viral etiology.

38. The answer is 5 [Chapter 2 I B 4 c (2)]. Laminitis (caused by gastrointestinal disease), neonatal septicemias (many of which are caused by gram-negative infections), and proximal enteritis (believed to be associated with gram-negative overgrowth) can all be associated with endotoxemia. Endotoxin (lipopolysaccharide endotoxin) is the cell wall of dying gram-negative organisms. Therefore, strangles (*Streptococcus equi* infection) clostridiosis, and dermatophilosis (*Dermatophilus congolensis* infection)—conditions produced by gram-positive organisms—do not result in endotoxemia. White muscle disease is a vitamin E/selenium deficiency of calves.

39. The answer is 2 [Chapter 7 I A 3-4, B 4 a]. Clinically, enzootic pneumonia is described in calves, growing (feeder) pigs, sheep (particularly lambs), and kids. Enzootic pneumonia is a chronic, nonprogressive pneumonia characterized by a low mortality rate but producing significant growth retardation in affected animals. It is most prevalent under conditions of overcrowding and intensive management. In calves, the disease process may begin as a viral respiratory infection that may

resolve or become complicated by bacterial infection, mycoplasmal infection (e.g., *Mycoplasma bovis*, *Mycoplasma dispar*, *Mycoplasma bovirhinis*, *Ureaplasma*), or both (multifactorial). *Mycoplasma hyopneumoniae* is the most common causative organism in feeder-pigs. In lambs, infections caused by *Mycoplasma ovipneumoniae*, *Bordetella parapertussis*, *Chlamydia*, and some viruses are believed to predispose the lung to invasion by *Pasteurella haemolytica*, resulting in pulmonary damage.

40. The answer is 1 [Chapter 3 II B 3]. Although there are many possible, rational recommendations a veterinarian can make regarding prevention of neonatal calf diarrhea, the only sound one in this subset of selections is to decrease contamination in the calving area by improving hygiene. Vaccination of cows must occur at a time prior to production of colostrum to ensure adequate levels of maternal antibody (i.e., 8 weeks prior to parturition). Oral antibiotics have not been shown efficacious in the treatment of enterotoxigenic *Escherichia coli* (ETEC) and are certainly of no value against viral pathogens. Limiting the amount of milk fed to healthy calves has not been shown to prevent diarrhea and there is a growing body of literature that recommends maintaining scouring calves on at least some milk. Milk should never be mixed with oral electrolytes for feeding.

41. The answer is 2 [Chapter 6 II A 3 a (3) (d) (ii), (4) (c)]. Respiratory signs may be accompanied by stiffness and transient limb edema. Myocarditis, which would account for the arrhythmia, may develop in complicated cases of equine influenza virus infection. Equine adenovirus infection is associated with only mild signs of respiratory disease, and no other complications. Equine rhinopneumonitis, caused by a herpesvirus, is unlikely to result in muscle damage. Equine viral arteritis (EVA) is unlikely to cause stiffness and is not associated with myositis or myocarditis. The clinical signs described are not consistent with strangles.

42. The answer is 4 [Chapter 13 I B 2 b]. Degenerating muscle cells release myoglobin at levels that exceed renal threshold and color the urine brown. Tying-up syndrome is not caused by vitamin E or selenium deficiency. It is seen in all ages of horses, and although this syndrome may be an inherited disorder of glycogen storage, it is not associated with liver disease.

43. The answer is 3 [Chapter 8 V A 1 b; V A 5 a (3); V A 5 b]. Bovine leukemia virus (BLV) sporadically causes multicentric lymphosarcoma. The right atrium is one of four common sites of neoplastic infiltration, including the uterus, internal and external lymph nodes, and the abomasum. The disease is virus-associated. Diagnosis includes the isolation of BLV from lymphocytes and echocardiographic evidence of a mass on the right atrium. Persistent lymphocytosis occurs in 33% of cattle infected with BLV. Bacterial endocarditis (BE) usually involves the tricuspid valve in cattle. Signs of right-sided heart failure, including dependent edema and distended jugular or mammary veins, are found in approximately one third of cases. No lymphadenopathy would be expected. A complete blood cell count (CBC) often reveals hyperfibrinogenemia, neutrophilia, and monocytosis. Similar hematologic findings may be found with traumatic reticulopericarditis. Cranial abdominal pain and poor rumen motility may also be found. *Borrelia burgdorferi* has not been definitively identified with myocarditis in cattle. In other species, other clinical findings usually occur in conjunction with cardiac signs, including lameness and fever. Cor pulmonale caused by pulmonary hypertension usually results in respiratory signs as well as cardiac signs. Neither lymphadenopathy nor lymphocytosis usually occur.

44. The answer is 2 [Chapter 17 I B 2 a (7)]. The most economic and medically sound recommendation is to cull or segregate affected animals. Lactation therapy (systemic or intramammary) is an ineffective treatment. Dry cow therapy is recommended, but it does not make economic sense to dry off all cows immediately. Stripping affected quarters is recommended for individual cows suffering from an acute or peracute episode of mastitis, but this is not appropriate with the subacute or subclinical mastitis seen on a herd basis with *Staphylococcus aureus*.

45. The answer is 5 [Chapter 7 I B 4 a]. *Mycoplasma hypopneumoniae* is the causative agent for enzootic pneumonia in growing pigs. Porcine reproductive and respiratory syndrome (PRRS) appears as respiratory distress in piglets. *Actinobacillus pleuropneumonia* can cause a chronic pneumonia but does not exhibit the same pathologic features as enzootic pneumonia. The subset of clinical and pathologic findings in the question best describes an enzootic pneumonia. Although *Pas-*

teurella multocida is often a secondary invader, swine influenza virus is not known as a primary initiator. Inadequate ventilation by itself does not produce enzootic pneumonia.

46. The answer is 4 [Chapter 9 I I 1]. Lactation tetany, grass tetany, grass staggers, and wheat pasture poisoning are synonyms for hypomagnesemic tetany. Milk fever is hypocalcemia. Alkali disease is selenium toxicosis. Eclampsia is hypocalcemia (e.g., in mares). "Downer" cow syndrome is recumbency without systemic signs (i.e., there is no tetany).

47. The answer is 2 [Chapter 15 II F 1]. Straining to urinate may be sufficient to prolapse the rectum, and obstructed sheep may also show tail wriggling. Signs of colic or discomfort usually abate when the bladder ruptures. A diverticulum in the penile urethra prevents the passage of a catheter. The ruptured bladder often spontaneously seals over in the steer. In sheep and goats, the blockage is usually sabulous (sandy), and the vermiform appendage may need amputation.

48. The answer is 4 [Chapter 2 III]. Squamous cell carcinoma of the stomach, malnutrition, granulomatous enteritis (lymphocytic-plasmacytic enteritis), or parasitism could all cause weight loss without other obvious clinical signs. A patient with chronic obstruction pulmonary disease (COPD) shows evidence of a compromised respiratory system (e.g., an increased respiratory rate and abnormal pattern) by the time the disease is advanced enough to cause weight loss. Liver fluke infestation (fascioliasis) is a disease of cattle, sheep, and goats. Lymphosarcoma is usually a disease of younger horses.

49. The answer is 3 [Chapter 11 I E 2-31]. These signs suggest sepsis and possible meningitis, which can be detected by a CSF sample. In a foal, these signs are not typical for neonatal maladjustment syndrome (NMS). The animal was normal up until 3 days after birth; NMS usually causes clinical signs within the first 24 hours. Signs for BVD infection are cerebellar and are noted immediately at birth. Hydrocephalus and hydranencephaly should be noted at birth, and fever and stiff neck are not part of these brain diseases.

50. The answer is 1 [Chapter 13 III A 3 e]. Sole ulcer is a circumscribed ulcer at the heel-sole junction of the foot. It is best

treated by trimming to expose the ulcer or protruding granulation tissue and paring away excess granulation tissue followed by a pressure bandage over the site. Blocking up the unaffected claw on the lame leg will aid in ambulation and healing.

51. The answer is 2 [Chapter 14 III A 1 b]. Tumors within the spinal canal (such as lymphosarcoma) put pressure on the cord, producing signs of spinal cord disease (particularly in the hindlimbs). The bovine leukemia virus (BLV), which causes bovine leukosis, is spread via contact with blood of infected animals. There is no effective vaccine against BLV. Many cows may be infected (virus-positive), but few (possibly as low as 2%) develop solid tissue tumors (lymphosarcoma). There is no record of transmission of this disease to humans.

52. The answer is 3 [Chapter 2 I B 1, 3 f (1)-(2)]. All of the following may produce a b dominal pain in foals: meconium impaction, gastric ulceration, intussusception, ascarid impaction, abdominal hernias (if a loop of bowel is entrapped within the hernial sac), and small intestinal volvulus. Cryptosporidiosis causes a nonpainful diarrhea in foals. Granulomatous enteritis causes a protein-losing and wasting enteropathy in adult horses.

53. The answer is 2 [Chapter 11 II C 1 b]. The animal most likely has polioencephalomalacia (PEM) with cortical blindness and dorsomedial strabismus. The drug of choice for this calf is thiamine (vitamin B₁). With lead toxicity, the rumen is usually static, and there should be some snapping of the eyelids. Nervous coccidiosis is not associated with cold months, and there is no sign of coccidiosis. Also, the calf is cortically blind, which suggests polioencephalomalacia or lead toxicity.

54. The answer is 3 [Chapter 17 I C 1 g]. Stripping the affected quarters as often as possible removes the endotoxin, which causes the clinical signs. Intramammary therapy is not warranted because the growth phase of the organism has passed by the time clinical signs are evident. Also, intramammary therapy does not likely diffuse well in the swollen udder. Oral fluids are not efficacious unless combined with intravenous fluids (hypertonic or isotonic). Calcium salts may be an adjunct to therapy but are not invariably necessary and can cause cardiac toxicity if administered too rapidly intravenously. Subcutaneous ad-

ministration of calcium may be considered. Dexamethasone is often indicated but only early in the course of the disease and only for one or two treatments.

55. The answer is 2 [Chapter 8 II A 1]. The calf has a ventricular septal defect (VSD). The small size of the calf suggests that the defect is large, producing a significant amount of blood that is shunted through the pulmonary circulation and a subsequent rise in venous return to the left atrium and ventricle. The murmur associated with a VSD is usually pansystolic and is heard loudest on the right side near the heart base. Cardiac catheterization reveals increased blood pressure in the right ventricle. A patent ductus arteriosus (PDA) produces a continuous heart murmur. Tricuspid valvular disease usually produces a holosystolic murmur with a point of maximal intensity (PMI) on the right side near the cardiac apex. The murmur associated with aortic insufficiency is holodiastolic, with the PMI over the aortic valve and radiating toward the left cardiac apex. Volume overload of the left ventricle may be present, resulting in impairment, in left ventricular function.

56. The answer is 2 [Chapter 14 I D]. The findings of acuteness of signs, anemia, icterus, a decreased packed cell volume (PCV), plasma discoloration, and pigmenturia all support a diagnosis of acute hemolytic anemia, which can be caused by babesiosis, equine infectious anemia (EIA), red maple leaf toxicosis, and immune-mediated causes. Anaplasmosis is a hemolytic anemia of ruminants. Equine exertional rhabdomyolysis produces pigmenturia (myoglobinuria), but not anemia and icterus. Pyelonephritis is most common in sows and cows, and is associated with the discharge of pus or blood from the urinary tract.

57. The answer is 1 [Chapter 11 III A 3 a-b, d]. These signs suggest equine protozoal myeloencephalitis (EPM) because the animal is older than 3 years [the age when wobbler and equine degenerative myelopathy (EDM) have occurred] and because muscle atrophy (lower motor neuron) is present. Cervical radiographs with myelography are for vertebral malformation, which occurs earlier in life and has no muscle atrophy of unilateral nature. Green pasture and fodder with supplemental vitamin E suggests EDM, which has no muscle atrophy and usually occurs before 1 year of age. A cerebrospinal fluid (CSF) sample of high protein with the lack of inflammatory

cells suggests EHV-1, which has a more sudden onset and often involves other illnesses (e.g., respiratory disease, abortion). Equine protozoal myelitis (EPM) is the likely diagnosis, but eosinophils are not a feature of the CSF cytology.

58. The answer is **1** [Chapter 13 III A 1 b]. The clinical findings best describe infectious pododermatitis or pasture foot rot. Laminitis may precede stable foot rot or **underrun** sole, which are conditions of the sole.

59. The answer is **4** [Chapter 9 III B 1, C]. Neonatal hypoglycemia of piglets results in hypothermia, weakness, and failure to move out of the way of sows. Lactation tetany occurs in mares, whereas vitamin E selenium deficiency, iron deficiency, or liver disease are not commonly related to piglet crushing deaths.

60. The answer is **2** [Chapter 3 II B 3 d]. *Cryptosporidium* parvum causes cryptosporidiosis in young calves. Transmission of the organism is by the fecal-oral route. Cryptosporidiosis, characterized by transient secretory diarrhea in affected calves, is usually associated with a full recovery; however, *C. parvum* can be a serious pathogen in immunocompromised individuals or those with mixed enteric infections.

61. The answer is **1** [Chapter 14 I D 1 b (1) (f)]. Neonatal **isoerythrolysis** in mule foals is due to the production of antibodies by the horse dam against the donkey blood antigen. Erythrocytes from any donkey would also be susceptible to lysis, and the mare's blood would contain additional antibody. Washed erythrocytes or whole blood from a horse donor would be the most effective treatment because plasma would not supply the necessary erythrocytes.

62. The answer is **3** [Chapter 2 I B 2 c (2), (3)]. Pendunculated lipoma, parasitic larval migration, and intestinal foreign body can all cause chronic, recurrent bouts of colic in horses as a result of large colon impaction. Other correct differential diagnoses include enterolith, thromboembolic infarction, sand impaction, and feed impaction. *Salmonellosis* may cause signs of colic, but only in the acute phases of the disease and not chronically. *Dictyocaulus arnfieldi* is a lungworm that affects donkeys and horses.

63. The answer is **1** [Chapter 11 II C 2 b]. The chronic form of lead toxicity results in recurrent choke, regurgitation of food, and aspiration pneumonia. Snapping eyelids, cortical blindness, head pressing, facial or trigeminal nerve deficits, aggressive behavior, and convulsions are signs of cranial nerve deficits and are not features of acute lead poisoning. Blindness should be accompanied by pupils that react to light (cortical blindness) in subacute lead toxicity. The differential signs between polioencephalomalacia (PEM) and lead toxicity include normal motility in PEM and an atonic rumen in lead toxicity.

64. The answer is **5** [Chapter 18 IV D 3 a (1) (b)]. An immunoglobulin G (IgG) concentration that exceeds **400 mg/dl** in a healthy foal on a well-managed farm is usually considered adequate and a plasma transfusion is not required to supplement immunoglobulin. It would be futile to supplement the foal with oral immunoglobulins, because she would absorb very little at the age of 22 hours. Because the foal is not systemically ill, broad-spectrum bactericidal antibiotics are not indicated, and in fact may create resistant bacterial populations on this farm.

65. The answer is **5** [Chapter 4 II A 5 e]. Intensive deworming is not usually necessary in winter months in North America. Furthermore, repeated use of **thiabendazole** promotes parasite resistance to this anthelmintic. An effective intestinal parasite control program for sheep in North America would include pre-lambing deworming of adults with **ivermectin**, deworming of lambs in the spring before turning them out on pasture, raising lambs indoors and feeding hay from elevated racks, and the use of pastures grazed by cattle for rotation into sheep grazing.

66. The answer is **3** [Chapter 14 I E 1 a]. The regenerative response is most common following anemia caused by acute blood loss or hemolysis. Hemoglobin synthesis is impaired with iron deficiency anemia, and the marrow's ability to respond to anemia through increased erythrocyte production is depressed.

67. The answer is **2** [Chapter 1 II C 1 a]. Horses with dental disease often prefer grain over hay because there is less chewing involved. Symptoms of dental disease in horses include quidding; slow, painful mastication; weight loss; and choke.

68. The answer is **5** [Chapter 14 I D 2]. Hemoglobinuria is a characteristic sign of intravascular hemolysis. Major causes of intravascular hemolysis in adult cattle include postparturient hemoglobinuria, babesiosis, and leptospirosis. *Babesia* are spread by ticks, whereas leptospires can be seen on examination of urine by dark-field microscopy. Postparturient hemoglobinuria in North America is thought to be caused by phosphorus deficiency, and the severity of hemolysis with this disease can be worsened by the ingestion of oxidant-containing plants. Rickettsial parasites typically cause extravascular hemolysis.

69. The answer is **1** [Chapter 18 VI B 4 b]. A patent urachus in a foal in the absence of infection (no fever or evidence of inflammation on blood work) can be treated conservatively. Surgery is indicated if chemical cauterization has not resolved the problem within 5 days; if there is evidence of infection of the umbilical

remnants on ultrasound examination (urachal abscess) or physical examination (heat, pain, purulent discharge); or if there is subcutaneous urine accumulation.

70. The answer is **1** [Chapter 14 IV B 2]. Characteristic findings in calves with leukocyte adhesion deficiency include lymphadenopathy, chronic digestive or respiratory tract infections, fever, and persistent neutrophilia.

71. The answer is **2** [Chapter 14 II B 3 a (1)]. Excessive hemorrhage after dehorning may be caused by the ingestion of moldy sweet clover. Prolonged prothrombin time or high concentrations of dicoumarol in the feed would support this diagnosis, and the administration of vitamin K₁ may decrease bleeding tendencies. Fungi can produce dicoumarol in hay or silage, and suspect feedstuffs of any type should not be fed.